



**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ////	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/IN2004/000318	International filing date (day/month/year) 12.10.2004	Priority date (day/month/year) 21.10.2003	
International Patent Classification (IPC) or national classification and IPC D06B3/02			
Applicant THE ARVIND MILLS LTD.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 9 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  19.05.2005		Date of completion of this report  20.02.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Goodall, C  Telephone No. +31 70 340-2604 	

INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITYInternational application No.  
PCT/IN2004/000318**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-21 as originally filed

**Drawings, Sheets**

1/2-2/2 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
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**Box No. IV Lack of unity of invention**

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1. ☐ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
  - ☒ not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
  - ☐ the parts relating to claims Nos. .

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-9,11,15-21
	No: Claims	10,12-14
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	10-21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/IN2004/000318

**1AP20 Rec'd FCT/PTO 20 APR 2006**

**Re Item IV**

**Lack of unity of invention**

The separate inventions/groups of inventions are:

1. Claims: 1-16

Apparatus and method for dyeing fibres using a supporting system for carrying the fibres

2. Claims: 17-20

Method for dyeing fibre in the form of a roving or of a tow of filaments

3. Claim : 21

Method for preparing yarn

1. These inventions or groups of inventions are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons.
2. The document DE 30 45 647 A (D3) discloses an apparatus for dyeing fibres comprising a prewetting trough (see page 38, lines 4-9), a dye bath (reference 12) and a drying arrangement (see page 42, lines 18-23).
  - 2.1 The subject-matter of independent claim 1 differs from this known apparatus principally in that it comprises a supporting system for carrying and dyeing the fibres continuously and homogeneously. This feature may be considered to be the special technical feature in the sense of Rule 13.2 PCT of the first invention or group of inventions.
  - 2.2 The problem to be solved by these special technical features may be regarded as to

facilitate the transport of loose fibres through the apparatus.

3. The document D3 also discloses a method for dyeing fibre comprising the steps of prewetting, dyeing and drying the fibre in the form of yarn, wherein the fibre is dyed continuously.
- 3.1 The subject-matter of independent claim 17 differs from this known method in that the fibre is formed into a roving and then prewetted, dyed and dried in this form, i.e. before the roving is spun into yarn. The subject-matter of independent claim 20 differs from this same known method in that the fibre is formed into a tow of filaments and then prewetted, dyed and dried in this form, i.e. before the filaments are spun into yarn. These features may be considered to be the special technical features of the second invention or group of inventions.
- 3.2 The problem to be solved by these special technical features may be regarded as to permit sufficient penetration of the dye into the core of the subsequently produced yarn.
4. The document D3 does not disclose a method for preparing yarn.
- 4.1 All the features of independent claim 21, namely the blending of differently dyed and undyed fibres and spinning indigo melange yarns directly from these blended fibres, may therefore be considered to be the special technical features of the third invention or group of inventions.
- 4.2 The problem to be solved by these special technical features may be regarded as to provide a method for preparing indigo melange yarn.
5. The three inventions or groups of inventions thus have special technical features which are not the same and which do not correspond since they solve different technical problems. Hence the application does not meet the requirements of unity of invention according to Rules 13.1 and 13.2 PCT.

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/IN2004/000318

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1 US 5 917 118 A  
D2 GB 829 835 A  
D3 DE 30 45 647 A  
D4 US 3 835 490 A  
D5 CH 612 557 A  
D6 US 3 787 182 A  
D7 US 4 248 592 A  
D8 US 3 107 397 A  
D9 US 1 717 633 A

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document) an apparatus for dyeing fibres comprising a dye bath (60), a drying arrangement (50) and a supporting system (61) for carrying and dyeing the fibres continuously and homogeneously.
- 2.1 The subject-matter of claim 1 differs from this known apparatus principally in that it comprises a plurality of prewetting troughs.
- 2.2 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).
- 2.3 The problem to be solved by the present invention may be regarded as to improve the dyeability of the fibres.

- 2.4 The solution to this problem of providing a plurality of prewetting troughs proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because it is neither known from, nor rendered obvious by, the available prior art.
3. Claims 2-9 are dependent on claim 1 and as such these claims also meet the requirements of the PCT with respect to novelty and inventive step.
4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not new in the sense of Article 33(2) PCT.
  - 4.1 The document D2 discloses a method for dyeing fibres comprising carrying the fibres using a supporting system (implicit in the disclosed method), prewetting the fibres along with the supporting system (see page 1, lines 70-71), dyeing the fibres along with the supporting system (see page 1, lines 73-75) and drying the fibres (see page 2, lines 4-5), wherein the dyeing of the fibres is continuous and homogeneous.
  - 4.2 The subject-matter of claim 10 is therefore not new (Article 33(2) PCT).
5. Dependent claims 11-16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step because they are disclosed in the following documents (see the passages cited in the search report).
  - 5.1 Document D2 discloses the features of claims 12-14 in combination with the features of claim 10.
  - 5.2 Document D1 discloses the features of claims 11-13 and 15.
  - 5.3 Document D3 discloses the features of claims 12,13,15 and 16.
6. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 does not involve an inventive step in the sense of Article 33(3) PCT.

- 6.1 The document D4 is regarded as being the closest prior art to the subject-matter of claim 17 and discloses (see claim 1) a method for dyeing fibre comprising the steps of forming a roving form of fibre (implicit in the disclosed method), dyeing the fibre in roving form and drying the fibre in roving form, wherein the fibres are dyed continuously and homogeneously.
- 6.2 The subject-matter of claim 17 therefore differs from this known method in that the fibre in roving form is prewetted before dyeing.
- 6.3 The problem to be solved by the present invention may therefore be regarded as to improve the dyeability of the fibre.
- 6.4 The solution proposed in claim 17 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because the feature of prewetting before dyeing is described in document D5 in order to improve the dyeability of fibre in the form of yarns. The skilled person would regard it as a normal option to include this feature in the method described in document D4 in order to improve the dyeability of fibre in roving form since there is no essential difference between the techniques required for the dyeing of yarns and those required for the dyeing of rovings.
7. Dependent claims 18 and 19 do not contain any features which, in combination with the features of claim 17 meet the requirements of the PCT in respect of inventive step because the features of these claims are disclosed in both D4 (see claim 7) and D5 (see page 3, column 1, lines 58-62).
8. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 20 does not involve an inventive step in the sense of Article 33(3) PCT.
- 8.1 The document D6 is regarded as being the closest prior art to the subject-matter of claim 20 and discloses (see column 1, lines 11-24) a method for dyeing fibre comprising the steps of forming a tow form of filaments, prewetting the filaments in tow form and dyeing the filaments in tow form, wherein the filaments are dyed



continuously and homogeneously.

- 8.2 The subject-matter of claim 20 therefore differs from this known method in that the filaments in tow form are dried after dyeing.
- 8.3 This drying step comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claim 20 lacks an inventive step (Article 33(3) PCT).
9. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 21 does not involve an inventive step in the sense of Article 33(3) PCT.
- 9.1 The document D7 is regarded as being the closest prior art to the subject-matter of claim 21 and discloses (see column 2, lines 41-47) a method for preparing yarn comprising the steps of blending dyed fibres with undyed fibres and spinning melange yarns directly from dyed fibres.
- 9.2 The subject-matter of claim 21 therefore differs from this known method in that the blended fibres are an indigo melange.
- 9.3 The problem to be solved by the present invention may therefore be regarded as to produce indigo melange yarns.
- 9.4 The solution proposed in claim 21 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because the blending of appropriately coloured fibres in order to produce indigo melange yarns comes within the scope of the customary practice followed by persons skilled in the art.
- 9.5 Claim 21 also lacks an inventive step over the disclosure of document D8 or over the disclosure of document D9.